Amendments to the Specification

IN THE WRITTEN DESCRIPTION

Please replace the paragraph beginning just below the title at page 1, line 1, with the following rewritten paragraph:

FIELD OF THE INVENTION

This invention relates to the texturing of 3-dimensional computer graphic images and in particular to a technique in which a mipmap chain of texture images is automatically generated during the process of texturing an image.

~~Background to the Invention~~BACKGROUND OF THE INVENTION

Please replace the paragraphs beginning at page 3, line 3, with the following rewritten paragraphs:

The ability to create automatically mipmap data is particularly useful when dynamically created textures such as dynamic environment maps are being used. These by their very nature do not have a pre-generated mipmap chain available. Using known systems, this is not possible unless rasterisation time is increased in the 3D hardware or additional read and write bandwidth from external memory is required if additional hardware is used.

We have appreciated that by utilising the internal storage of a tile--based 3D graphics engine, a number of mipmap levels can be generated for e.g. a dynamic environment texture map with no additional hardware passes. Any further mipmap levels that are subsequently required can then be generated at a fraction of the bandwidth cost associated with an IMR system.

Preferably, in a tile--based 3D graphics engine, a memory buffer known as the tile buffer is used for temporary storage of mipmap levels as they are generated. In normal usage the

tile buffer is used to store a rectangular portion of the image being rendered.

Please replace the paragraphs beginning at page 6, line 24, with the following rewritten paragraphs:

Twiddled storage of texture reduces memory page breaks by grouping blocks adjacent to texels into physical blocks within the memory. A group of four texels is first organised to make 2x2 blocks. Four of these 2x2 blocks are then organised into a 4x4 block. Four of the 4x4 blocks are then organised into a 16x16 block and so on. This is achieved by bit interleaving the horizontal and vertical coordinates of the memory addresses. This process can be understood straightforwardly in the context of a tile-based rendering 3D graphics engine. In such a system there is already in existence a storage buffer known as a tile buffer. This is used to store a rectangular tile of the rendered image as it is being rendered. Images rendered on a tile-by-tile basis in such systems to reduce the number of objects required to be considered for each pixel.

This tile buffer can be utilised as the local storage buffer 2 of figure 2 for the auto-generation of mipmaps. In a first pass the original image (up to one tile in size) is stored in this buffer. The box filter 2 then filters the image to ½ those dimensions and stores the result in the tile buffer. This takes up only ¼ of the buffer ~~is~~as the original data was one tile in size. The new data is then filtered again with the results being stored in the tile buffer now at 1/16 of the size of the original data. The process repeats until the final mipmap level (generally one pixel by one pixel) is generated. After each step, the mipmap level generation is stored temporarily in the tile buffer and then in the main system memory. Each subsequent mipmap level overwrites at least part of the previous level in the tile buffer.